

Application No. 09/935,337
Amendment Dated March 30, 2004
Reply to Office Action of January 30, 2004

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (currently amended) An assembly for making an electrofusion weld joint, comprising:
 - a melttable member;
 - at least one fastener; and
 - a heating element secured to said melttable member by said at least one fastener, at least a portion of said at least one fastener is between an inner surface and an outer surface of said melttable member, said at least one fastener being adapted to prevent substantial movement of said heating element when supplying said heating element with power.
2. (original) The assembly of claim 1, wherein
said at least one fastener partially surrounds a portion of said heating element and extends through at least a portion of a predetermined melt zone of said melttable member into a non-melt zone of said melttable member to prevent substantial movement of said heating element when said predetermined melt zone is molten.
3. (original) The assembly of claim 1, wherein
said heating element is substantially S-shaped.
4. (original) The assembly of claim 1, wherein
said heating element is substantially V-shaped.
5. (original) The assembly of claim 3, wherein
said at least one fastener secures said heating element to said melttable member at each bend of said substantially S-shaped heating element.

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6. (original) The assembly of claim 1, wherein
said meltable member is made of a thermoplastic material.
7. (original) The assembly of claim 1, wherein
said meltable member is a pipe having a bell end.
8. (original) The assembly of claim 7, wherein
said bell end of said pipe is tapered.
9. (original) The assembly of claim 8, wherein
said taper is about 3 to 10 degrees.
10. (original) The assembly of claim 1, wherein
said meltable member is a pipe having a spigot end.

Claims 11 – 16 – canceled

17. (original) A pipe assembly for making an electrofusion joint, comprising:
a pipe having a first end and a second end; and
a heating element for creating a predetermined melt zone in said pipe proximal
said heating element when said heating element is supplied with
electrical current;
said heating element being attached to said first end of said pipe by at least
one fastener;
said at least one fastener at least partially surrounding a portion of said heating
element and extending through said predetermined melt zone of said
pipe into a non-melt zone portion of said pipe to prevent substantial
movement of said heating element when said predetermined melt zone
is molten.

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18. (original) The pipe assembly of claim 17, wherein
said first pipe end is a bell end.
19. (original) The pipe assembly of claim 18, further comprising
a second pipe having a spigot end received by said bell end for making an
electrofusion joint.
20. (original) The pipe assembly of claim 17, wherein
said bell end of said pipe is tapered.
21. (original) The pipe assembly of claim 20, wherein
said taper is about 3 to 10 degrees.
22. (original) The pipe assembly of claim 17, wherein
said first pipe end is a spigot end.
23. (original) The pipe assembly of claim 22, further comprising
a second pipe having a bell end for receiving said spigot end for making an
electrofusion joint.
24. (original) The pipe assembly of claim 23, wherein
said bell end of said second pipe is tapered.
25. (original) The pipe assembly of claim 24, wherein
said taper is about 3 to 10 degrees.
26. (original) An assembly for making an electrofusion joint, comprising:
a first pipe having a spigot end;
a second pipe having a bell end for receiving said spigot end of said first pipe;
a heating element attached to said bell end of said second pipe or to said spigot
end of said first pipe for creating a melt zone having a melt zone

portion in each of said first and second pipes proximal said heating element when supplying said heating element with electrical current; and

at least one fastener at least partially surrounding said heating element and extending through said melt zone portion of said pipe to which said heating element is attached and into a non-melt zone of said pipe in which said heating element is attached to prevent substantial movement of said heating element when supplying said heating element with electrical current for making said electrofusion joint.

27. (original) The assembly of claim 26, wherein
said heating element has a substantially zigzag shape.
28. (original) The assembly of claim 26, wherein
said heating element has a substantially helical shape.
29. (original) The assembly of claim 26, wherein
said first and second pipes are formed of thermoplastic polymers.
30. (original) The assembly of claim 26, wherein
said at least one fastener is metallic.
31. (original) The assembly of claim 26, wherein
said bell end of said second pipe is tapered to facilitate receiving said spigot end of said first pipe.
32. (original) The assembly of claim 31, wherein
said taper is substantially 3 to 10 degrees.

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33. (original) The assembly of claim 26, wherein

at least two heating elements are embedded in said spigot end of said first pipe or in said bell end of said second pipe for creating said melt zone proximal each of said heating elements when supplying power to each of said at least two heating elements for making said electrofusion joint.

34. (original) The assembly of claim 26, wherein

said first and second pipes have a diameter of at least eighteen inches.

Claims 35 – 44 – canceled

45. (original) A method of forming an electrofusion joint, comprising:

providing a first pipe having a spigot end;

providing a second pipe having a bell end;

embedding a heating element and a plurality of fasteners in either said spigot end of said first pipe or in said bell end of said second pipe, said at least one fastener extending through a predetermined melt zone into a non-melt zone portion of said embedded pipe;

inserting said spigot end of said first pipe into said bell end of said second pipe;

creating a predetermined melt zone proximal said heating element by supplying electrical current to said heating element, said heating element being prevented from substantially moving when said predetermined melt zone is molten by said at least one fastener extending through said melt zone and into said non-melt zone of said embedded pipe; and

terminating said supply of electrical current to said heating element to fuse said first and second pipes together.

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46. (original) The method according to claim 45, wherein embedding a heating element and a plurality of fasteners further comprises:

positioning said heating element within an inserting ring;
positioning said inserting ring within said spigot end of said first pipe or in
said bell end of said second pipe;
inserting at least one of said at least one fastener to initially fix said heating
element to said pipe;
removing said inserting ring;
inserting remaining plurality of fasteners to securely fix said heating element
within pipe;
inserting a welding ring within said pipe in which said heating element is
securely fixed;
heating said welding ring to soften said pipe end proximal said welding ring,
thereby causing said heating element and said plurality of fasteners to
sink into softened pipe;
terminating said heating of said welding ring, thereby embedding said heating
element and said plurality of fasteners in said pipe; and
removing said welding ring.

47. (original) The method according to claim 45, wherein
providing a second pipe having a bell end comprises providing said second
pipe having a tapered bell end.

48. (original) The method according to claim 47, wherein
providing said second pipe having a tapered bell end comprises providing said
tapered bell end with a taper of about 3 to 10 degrees.

49. (original) The method according to claim 47, further comprising
positioning a tensioning ring around said bell end of said second pipe; and
forcing said bell end of said second pipe proximal said first pipe with said
tensioning ring.

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50. (original) The method according to claim 49, further comprising positioning a support member within said first and second pipes before forcing said bell end of said second pipe proximal said first pipe for supporting said first and second pipes while applying said force with said tensioning ring.
51. (original) The method according to claim 45, wherein providing said first and second pipes comprises providing said first and second pipes having diameters of at least eighteen inches.

Claims 52 – 72 - canceled

73. (previously added) The assembly of claim 1, wherein said inner and outer surfaces of said meltable member are circumferential.
74. (previously added) The assembly of claim 1, wherein said at least a portion of said at least one fastener is embedded between said inner surface and said outer surface of said meltable member.
75. (previously added) The assembly of claim 1, wherein said at least one fastener is integrally connected to said heating element.
76. (previously added) The assembly of claim 75, wherein said at least one fastener extends through at least a portion of a predetermined melt zone of said meltable member into a non-melt zone of said meltable member to prevent substantial movement of said heating element when said predetermined melt zone is molten.

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77. (previously added) An assembly for making an electrofusion weld joint, comprising:
 - a melttable member;
 - at least one fastener; and
 - a heating element secured to said melttable member by said at least one fastener, said at least one fastener at least partially surrounds a portion of said heating element and extends through at least a portion of a predetermined melt zone of said melttable member into a non-melt zone of said melttable member to prevent substantial movement of said heating element when said predetermined melt zone is molten.
78. (previously added) The assembly of claim 77, wherein
said heating element is substantially S-shaped.
79. (previously added) The assembly of claim 77, wherein
said heating element is substantially V-shaped.
80. (previously added) The assembly of claim 78, wherein
said at least one fastener secures said heating element to said melttable member
at each bend of said substantially S-shaped heating element.
81. (previously added) The assembly of claim 77, wherein
said melttable member is made of a thermoplastic material.
82. (previously added) The assembly of claim 77, wherein
said melttable member is a pipe having a bell end.
83. (previously added) The assembly of claim 82, wherein
said bell end of said pipe is tapered.
84. (previously added) The assembly of claim 83, wherein
said taper is about 3 to 10 degrees.

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85. (previously added) The assembly of claim 77, wherein
said melttable member is a pipe having a spigot end.
86. (newly added) The assembly of claim 1, wherein
said at least one fastener is made of a material different from that of said
melttable member.
87. (newly added) The assembly of claim 86, wherein
said fastener is metallic and said melttable member is made of a thermoplastic
material.